

CLAIMS

What is claimed is:

1 1. A method of providing sets of network addresses for dynamically configuring hosts  
2 on a network, the method comprising the computer-implemented steps of:  
3 sending a first request for a first count of network addresses for a first set of network  
4 addresses for dynamically configuring hosts on the network;  
5 receiving a first message indicating the first set of network addresses;  
6 receiving a second message requesting a second count of network addresses for a  
7 second set of network addresses for dynamically configuring hosts on the  
8 network;  
9 determining the second set of network addresses based at least in part on the first set  
10 of network addresses and the second count; and  
11 sending a first response indicating the second set of network addresses.

1 2. A method as recited in Claim 1, further comprising:  
2 receiving, from a first host on the network, a third message requesting a network  
3 address; and  
4 sending, to the first host in response to the second message, a second response  
5 offering a first network address based on the first set of network addresses and  
6 the second set of network addresses.

1 3. A method as recited in Claim 2, wherein the first set includes the first network  
2 address and the second set does not include the first network address.

1 4. A method as recited in Claim 1, further comprising receiving from a network  
2 administrator a third message indicating a third set of network addresses for dynamically  
3 configuring hosts on the network.

1 5. A method as recited in Claim 1, further comprising determining usage of the first set  
2 of network addresses.

1 6. A method as recited in Claim 5, further comprising reporting the usage of the first set  
2 of network addresses.

1 7. A method as recited in Claim 5, said step of determining the second set of network  
2 addresses is further based at least in part on the usage of the first set of network addresses.

1 8. A method as recited in Claim 5, wherein:  
2 the first message further indicates a first time interval for use of the first set; and  
3 the method further comprises sending, before the first time interval expires, a second  
4 request for renewal of use of the first set; and  
5 the second request includes data indicating the usage of the first set.

1 9. A method as recited in Claim 1 further comprising the computer-implemented steps  
2 of:  
3 receiving a third message for renewal of use of the second set, the third message  
4 including data indicating the usage of the second set,  
5 determining a third set of network addresses for dynamically configuring hosts on the  
6 network based on the second set and the usage of the second set; and  
7 sending a second response indicating the second set of network addresses.

1 10. A method as recited in Claim 1, wherein each set of the first set and the second set is  
2 indicated by a base address and a number indicating a range of addresses above the base  
3 address.

1 11. A method as recited in Claim 10, wherein the number indicating the range is a mask  
2 that indicates a number of most significant bits in the base address that are constant over the  
3 range.

1 12. A method as recited in Claim 1, wherein the second set is empty.

1 13. A method as recited in Claim 1, wherein the second set is the same as the first set.

1 14. A method as recited in Claim 1, wherein the hosts on the network include interfaces  
2 on a router on the network.

1 15. A method as recited in Claim 1, further comprising:  
2 receiving, from a router on the network, a third message requesting a third count of  
3 network addresses for a third set of network addresses for configuring  
4 interfaces on the router;  
5 determining the third set of network addresses based at least in part on the first set of  
6 network addresses, the second set of network addresses, and the third count;  
7 and  
8 sending, to the router in response to the third message, a second response indicating  
9 the third set of network addresses.

1 16. A method as recited in Claim 1, wherein:  
2 the first message received includes data indicating that a first server should send a  
3 third set of network addresses for dynamically configuring hosts on the  
4 network; and  
5 the method further comprises sending, in response to the data indicating that the first  
6 server should send the third set, a second request for the third set of network  
7 addresses.

1 17. A method as recited in Claim 16, further comprising receiving, from the first server in  
2 response to the second request, a third message indicating the third set of network addresses.

1 18. A method as recited in Claim 1, further comprising:  
2 determining that a third set of network addresses should be sent based at least in part  
3 on the first set and the second set; and  
4 inserting into the first response data indicating that a third set of network addresses  
5 for dynamically configuring hosts on the network should be sent.

1 19. A method as recited in Claim 18, wherein:  
2 the method further comprises determining usage of the first set of network addresses;  
3 and  
4 said step of determining that a third set of network addresses should be sent is based  
5 at least in part on the usage of the first set.

1 20. A method as recited in Claim 18, further comprising receiving, in response to the data  
2 indicating that the third set of network addresses should be sent, a third message requesting  
3 the third set of network addresses.

1 21. A method of providing sets of network addresses for dynamically configuring hosts  
2 on a network, the method comprising the computer-implemented steps of:  
3 receiving, from a first server on the network, a first message indicating a first set of  
4 network addresses for dynamically configuring hosts on the network and a  
5 first time interval for use of the first set;  
6 determining usage of the first set of network addresses; and  
7 sending, to the first server before the first time interval expires, a second request for  
8 renewal of use of the first set,  
9 wherein the second request includes data indicating the usage of the first set.

1    22. A method of providing sets of network addresses for dynamically configuring hosts  
2    on a network, the method comprising the computer-implemented steps of:  
3        sending, to a first server on the network, a first message indicating a first set of  
4        network addresses for dynamically configuring hosts on the network and a  
5        first time interval for use of the first set;  
6        receiving, from the first server before the first time interval expires, a request for  
7        renewal of use of the first set, the request including data indicating the usage  
8        of the first set,  
9        determining a second set of network addresses for dynamically configuring hosts on  
10      the network based on the first set and the usage of the first set; and  
11      sending to the first server a second message indicating the second set of network  
12      addresses.

1    23. A method of providing sets of network addresses for dynamically configuring hosts  
2    on a network, the method comprising the computer-implemented steps of:  
3        sending, to a first server, a first request for a first count of network addresses for a  
4        first set of network addresses for dynamically configuring hosts on the  
5        network;  
6        receiving, from the first server in response to the first request, a first message  
7        including first data indicating the first set of network addresses and second  
8        data indicating that the first server should send a second set of network  
9        addresses for dynamically configuring hosts on the network; and  
10      sending, to the first server in response to the data indicating that the first server  
11      should send the second set, a second request for the second set of network  
12      addresses.

1 24. A method of providing sets of network addresses for dynamically configuring hosts  
2 on a network, the method comprising the computer-implemented steps of:  
3 receiving, from a first server, a first request for a first count of network addresses for  
4 a first set of network addresses for dynamically configuring hosts on the  
5 network;  
6 determining usage of a second set of network addresses for dynamically configuring  
7 hosts on the network;  
8 determining the first set of network addresses based at least in part on the first count  
9 and the usage of the second set;  
10 determining a third set of network addresses for dynamically configuring hosts on the  
11 network based at least in part on the first set and the usage of the second set;  
12 and  
13 sending, to the first server in response to the first request, a first message including  
14 first data indicating the first set of network addresses and second data  
15 indicating that a third set of network addresses should be sent.

1 25. A computer-readable medium carrying one or more sequences of instructions for  
2 providing sets of network addresses for dynamically configuring hosts on a network, which  
3 instructions, when executed by one or more processors, cause the one or more processors to  
4 carry out the steps of:  
5 sending a first request for a first count of network addresses for a first set of network  
6 addresses for dynamically configuring hosts on the network;  
7 receiving, in response to the first request, a first message indicating the first set of  
8 network addresses;  
9 receiving a second message requesting a second count of network addresses for a  
10 second set of network addresses for dynamically configuring hosts on the  
11 network;  
12 determining the second set of network addresses based at least in part on the first set  
13 of network addresses and the second count; and

14                    sending, in response to the second message, a first response indicating the second set  
15                    of network addresses.

1    26.    An apparatus for providing sets of network addresses for dynamically configuring  
2    hosts on a network, comprising:  
3                    means for sending a first request for a first count of network addresses for a first set  
4                    of network addresses for dynamically configuring hosts on the network;  
5                    means for receiving, in response to the first request, a first message indicating the first  
6                    set of network addresses;  
7                    means for receiving a second message requesting a second count of network  
8                    addresses for a second set of network addresses for dynamically configuring  
9                    hosts on the network;  
10                    means for determining the second set of network addresses based at least in part on  
11                    the first set of network addresses and the second count; and  
12                    means for sending, in response to the second message, a first response indicating the  
13                    second set of network addresses

1    27.    An apparatus for providing sets of network addresses for dynamically configuring  
2    hosts on a network, comprising:  
3                    a network interface that is coupled to the network for sending and receiving one or  
4                    more packet flows therefrom;  
5                    a processor; and  
6                    one or more stored sequences of instructions which, when executed by the processor,  
7                    cause the processor to carry out the steps of:  
8                    sending a first request for a first count of network addresses for a first set of  
9                    network addresses for dynamically configuring hosts on the network;  
10                    receiving, in response to the first request, a first message indicating the first  
11                    set of network addresses;

12 receiving a second message requesting a second count of network addresses  
13 for a second set of network addresses for dynamically configuring  
14 hosts on the network;  
15 determining the second set of network addresses based at least in part on the  
16 first set of network addresses and the second count; and  
17 sending, in response to the second message, a first response indicating the  
18 second set of network addresses.

1 28. A method as recited in Claim 1, wherein the second message includes data indicating  
2 that a requesting device that issued the second message does not make assignments of  
3 individual network addresses from among the second set of network addresses such  
4 that all future requests for such assignments will be relayed back.

1 29. A method as recited in Claim 1, wherein the second message includes data indicating  
2 that a requesting DHCP server should free the second set of network addresses as  
3 soon as possible by making no new assignments of addresses or subnets therefrom.

1 30. A method as recited in Claim 1, wherein the second message includes data indicating  
2 that a requesting DHCP server should discontinue use of the second set of network  
3 addresses when all addresses in the subnet are unassigned.

1 31. A method of providing subnets of network addresses for dynamically configuring  
2 hosts on a network using the dynamic host control protocol (DHCP), the method  
3 comprising the computer-implemented steps of:  
4 sending a first DHCP request for a first count of network addresses for a first subnet  
5 of network addresses for dynamically configuring hosts on the network;  
6 receiving a first DHCP message indicating the first subnet;  
7 receiving a second DHCP message requesting a second count of network addresses  
8 for a second subnet of network addresses for dynamically configuring hosts  
9 on the network;

10 determining the second subnet based at least in part on the first set of network  
11 addresses, the second count, and a pool of available subnets; and  
12 sending a first DHCP response indicating the second subnet.

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